

U.S. Patent Application Serial No. **10/030,185**
Amendment filed September 13, 2005
Reply to OA dated June 13, 2005

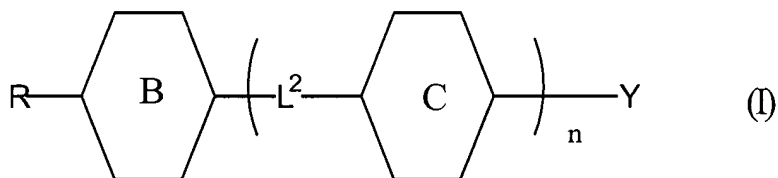
AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings, of claims in the application:

Listing of Claims:

Amend claims as follows:

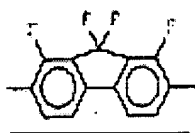
Claim 1 (currently amended): A fused ring compound represented by a general formula (I)



(wherein, R represents an alkyl group or alkoxyl group of 1 to 16 carbon atoms, an alkenyl group of 2 to 16 carbon atoms, an alkenyloxy group of 3 to 16 carbon atoms, or an alkyl group of 1 to 12 carbon atoms substituted with an alkoxyl group of 1 to 10 carbon atoms, and said groups may be substituted with a halogen, and in cases in which an asymmetric carbon arises due to substitution or branching, may be either one of optically active and a racemic mixture; ring C represents any one of a trans-1,4-cyclohexylene group in which one CH₂ structure within said

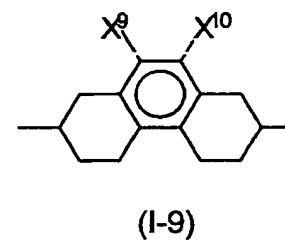
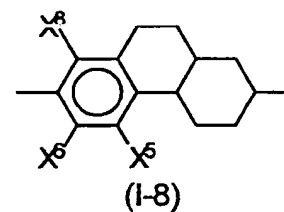
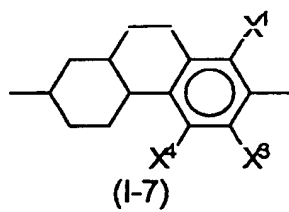
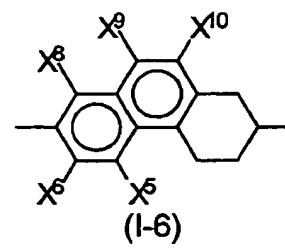
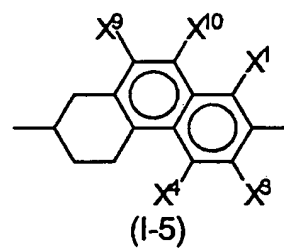
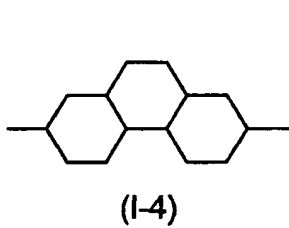
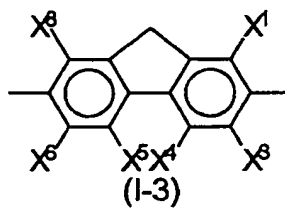
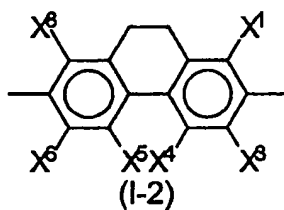
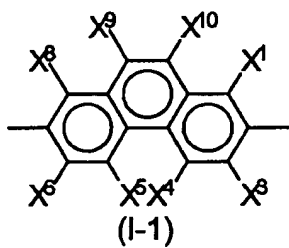
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group or two or more non-adjacent CH₂ structures within said group may be replaced with -O- and/or -S-, a 1,4-phenylene group in which one CH structure within said group or two or more non-adjacent CH structures within said group may be replaced with -N=, a 1,4-cyclohexenylene group, a 1,4-bicyclo(2.2.2)octylene group, a piperidine-1,4-diyl group, a naphthalene-2,6-diyl group, a trans-decahydronaphthalene-trans-2,6-diyl group, and a 1,2,3,4-tetrahydronaphthalene-2,6-diyl group, and said groups may be substituted with either one of a cyano group and a halogen; ring B represents any one of general formulas (I-1) to ~~(I-9)~~ (I-10):



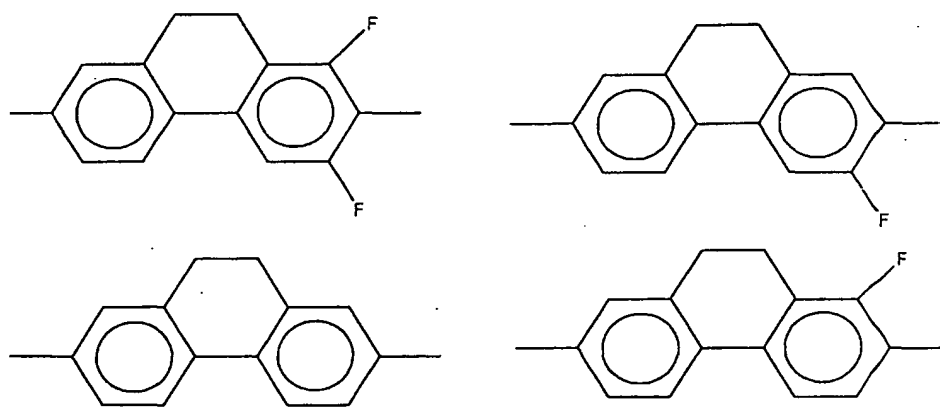
(I-10)

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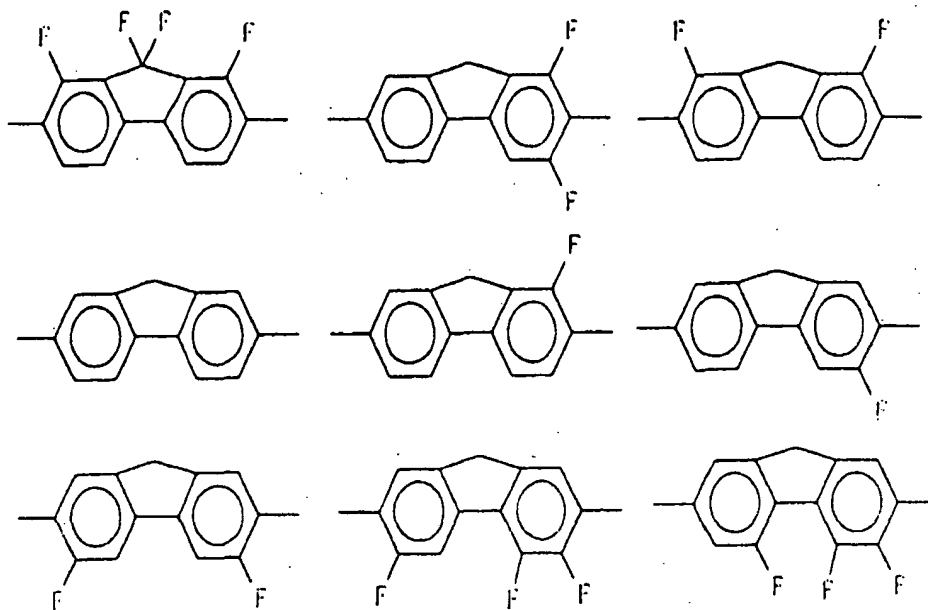
(wherein, X^1 , X^3 , X^4 , X^5 , X^6 , X^8 , X^9 and X^{10} each represent, independently, any one of a hydrogen atom, a chlorine atom and a fluorine atom, provided that conditions described below are satisfied:

- a. in (I-1), in a case in which at least one of X^3 , X^4 , X^5 and X^6 represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^1 , X^8 , X^9 and X^{10} represents either one of a chlorine atom and a fluorine atom,
- b. in (I-1), in a case in which at least one of X^1 , X^8 , X^9 and X^{10} represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^3 , X^4 , X^5 and X^6 represents either one of a chlorine atom and a fluorine atom,
- c. [[d.]] in (I-2), ring B represents any one of general formulas as follows:



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and in place of (I-3), ring B represents any one of general formulas as follows:



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L^2 represents any one of $-\text{CH}_2\text{CH}_2-$, $-\text{C}\equiv\text{C}-$, $-(\text{CH}_2)_4-$, $-\text{CF}=\text{CF}-$, $-\text{OCH}_2-$, $-\text{CH}_2\text{O}-$, $-\text{OCF}_2-$, $-\text{CF}_2\text{O}-$, $-\text{CO}_2-$, $-\text{OCO}-$, $-\text{CH}=\text{N}-\text{N}=\text{CH}-$, $-\text{CH}=\text{CH}-\text{CH}_2-\text{CH}_2-$, $-\text{CH}_2-\text{CH}_2-\text{CH}=\text{CH}-$ and a single bond; n represents 0 or 1; Y represents any one of a hydrogen atom, a fluorine atom, a chlorine atom, a trifluoromethoxy group, a difluoromethoxy group, a trifluoromethyl group, a 3,3,3-trifluoroethoxy group, a cyano group, a straight chain alkyl group of 1 to 16 carbon atoms, a straight chain alkenyl group of 2 to 16 carbon atoms, a straight chain alkyloxy group of 1 to 12 carbon atoms, and a straight chain alkenyloxy group of 2 to 16 carbon atoms, provided that cases described below are excluded:

- i. a case in which ring B represents (I-2), n represents 0, R represents an alkyl group and Y represents an alkyl group,
- ii. a case in which ring B represents (I-3), n represents 0, R represents an alkyl group and Y represents an alkoxy group,
- iii. a case in which ring B represents (I-4), n represents 0, R represents an alkyl group and Y represents either one of an alkyl group and a cyano group,
- iv. a case in which ring B represents (I-8), n represents 0, R represents an alkyl group and Y represents an alkyl group,
- v. a case in which ring B represents (I-4), n represents 1, ring C represents a 1,4-phenylene group, L^2 represents $-\text{CO}_2-$, R represents an alkyl group and Y represents any one of an alkyl group, an alkoxy group and a cyano group,
- vi. a case in which ring B represents (I-4), n represents 1, ring C represents a 1,4-phenylene group, L^2 represents $-\text{OCO}-$, R represents an alkyl group and Y represents an alkoxy group,

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- vii. a case in which ring B represents (I-2), n represents 1, ring C represents a 1,4-cyclohexylene group, L^2 represents $-CO_2-$, R represents an alkyl group and Y represents an alkyl group,
- viii. a case in which ring B represents (I-1), and X^9 and X^{10} represent fluorine atoms, and
- ix. a case in which ring B represents (I-3), and X^3 , X^4 , X^5 and X^6 simultaneously represent fluorine atoms, and
- x. a case in which ring B represents (I-1), Y does not represent a fluorine atom when $n=0$, X^1 , X^3 , $X^4=F$ and $R=Me$).

Claim 2 (previously presented): A compound according to claim 1, wherein ring C represents a 1,4-phenylene group or a trans-1,4-cyclohexylene group which may be substituted with at least one fluorine atom.

Claim 3 (previously presented): A compound according to claim 1, wherein L^2 represents any one of $-OCO-$, $-CO_2-$, $-CH_2CH_2-$ and a single bond.

Claim 4 (canceled).

Claim 5 (previously presented): A compound according to claim 1, wherein L^2 represents a single bond.

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Claim 6 (previously presented): A compound according to claim 1, wherein ring B represents (I-3) or (I-4).

Claims 7-8 (canceled).

Claim 9 (previously presented): A compound according to claim 1, wherein ring C represents a 1,4-phenylene group or a trans-1,4-cyclohexylene group which may be substituted with at least one fluorine atom, and ring B represents any one of (I-1), (I-2), (I-3) and (I-4).

Claim 10 (previously presented): A compound according to claim 1, wherein ring C represents a 1,4-phenylene group or a trans-1,4-cyclohexylene group which may be substituted with at least one fluorine atom, ring B represents any one of (I-1), (I-2), (I-3) and (I-4), and L^2 represents a single bond.

Claim 11 (Previously presented): A compound according to claim 1, wherein ring C represents a 1,4-phenylene group or a trans-1,4-cyclohexylene group which may be substituted with at least one fluorine atom, ring B represents any one of (I-1), (I-2), (I-3) and (I-4), n represents 1, and L^2 represents a single bond.

Claim 12 (canceled).

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Claim 13 (previously presented): A compound according to claim 1, wherein R represents either one of a straight chain alkyl group of 1 to 12 carbon atoms and a straight chain alkenyl group of 2 to 12 carbon atoms, and Y represents any one of a fluorine atom, a chlorine atom, a trifluoromethoxy group, a trifluoromethyl group, a difluoromethoxy group, a 3,3,3-trifluoroethoxy group and a cyano group.

Claim 14 (original): A liquid crystal composition incorporating at least one compound according to any one of claims 1 through 13.

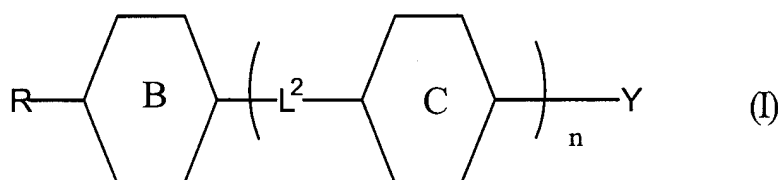
Claim 15 (original): A liquid crystal display element utilizing a liquid crystal composition according to claim 14.

Claim 16 (original): An active matrix driven liquid crystal display element utilizing a liquid crystal composition according to claim 14.

Claim 17 (original): A supertwisted nematic liquid crystal display element utilizing a liquid crystal composition according to claim 14.

Claim 18 (previously amended): A fused ring compound represented by a general formula

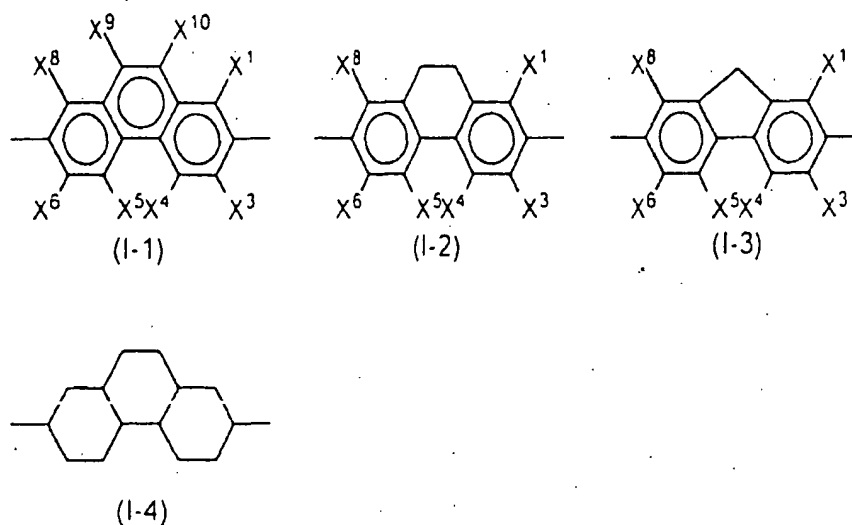
(I)



(wherein, R represents an alkyl group or an alkyl group of 1 to 12 carbon atoms substituted with an alkoxy group of 1 to 10 carbon atoms, and said groups may be substituted with a halogen, and in cases in which an asymmetric carbon arises due to substitution or branching, may be either one of optically active and a racemic mixture; ring C represents any one of a trans-1,4-cyclohexylene group in which one CH₂ structure within said group or two or more non-adjacent CH₂ structures within said group may be replaced with -O- and/or -S-, a 1,4-phenylene group in which one CH structure within said group or two or more non-adjacent CH structures within said group may be replaced with -N=, a 1,4-cyclohexenylene group, a 1,4-bicyclo(2.2.2)octylene group, a piperidine-1,4-diyl group, a naphthalene-2,6-diyl group, a trans-decahydronaphthalene-trans-2,6-diyl group, and a 1,2,3,4-

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tetrahydronaphthalene-2,6-diyl group, and said groups may be substituted with either one of a cyano group and a halogen; ring B represents any one of general formulas (I-1) to (I-4)



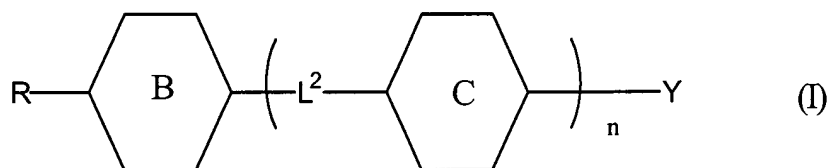
(wherein, X^1 , X^3 , X^4 , X^5 , X^6 , X^8 , X^9 and X^{10} each represent, independently, any one of a hydrogen atom, a chlorine atom and a fluorine atom, provided that conditions described below are satisfied:

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- a. in (I-1) and (I-2), in a case in which at least one of X^3 , X^4 , X^5 and X^6 represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^1 , X^8 , X^9 and X^{10} represents either one of a chlorine atom and a fluorine atom, and
- b. in (I-1) and (I-2), in a case in which at least one of X^1 , X^8 , X^9 and X^{10} represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^3 , X^4 , X^5 and X^6 represents either one of a chlorine atom and a fluorine atom); and n represents 1, then L^2 when present, represents a single bond; and Y represents a fluorine atom.

Claim 19 (currently amended): A fused ring compound represented by a general formula

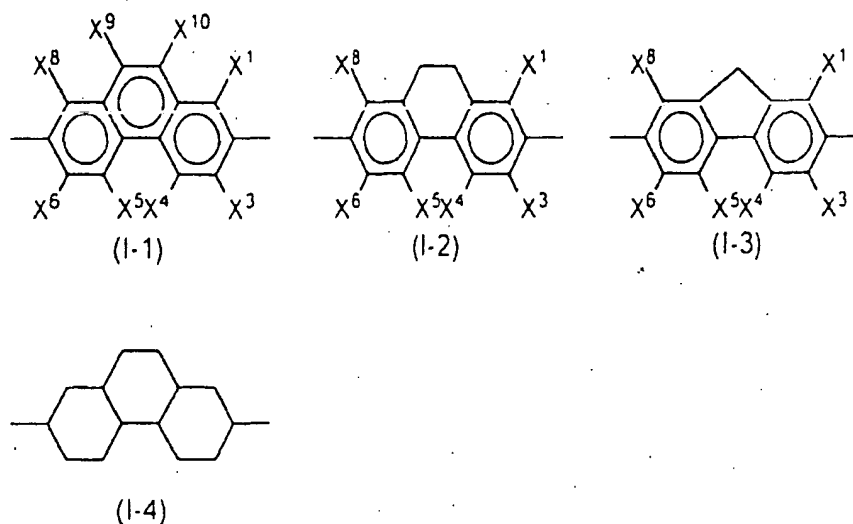
(I)



(wherein, R represents an alkyl group or alkoxyl group of 1 to 16 carbon atoms, an alkenyl group of

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2 to 16 carbon atoms, an alkenyloxy group of 3 to 16 carbon atoms, or an alkyl group of 1 to 12 carbon atoms substituted with an alkoxyl group of 1 to 10 carbon atoms, and said groups may be substituted with a halogen, and in cases in which an asymmetric carbon arises due to substitution or branching, may be either one of optically active and a racemic mixture; ring C represents a trans-1,4-cyclohexylene group which may be substituted with a fluorine atom, or a 1,4-phenylene; and ring B represents any one of general formulas (I-1) to (I-4)



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(wherein, X^1 , X^3 , X^4 , X^5 , X^6 , X^8 , X^9 and X^{10} each represent, independently, any one of a hydrogen atom, a chlorine atom and a fluorine atom, provided that conditions described below are satisfied:

- a. in (I-1) and (I-2), in a case in which at least one of X^3 , X^4 , X^5 and X^6 represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^1 , X^8 , X^9 and X^{10} represents either one of a chlorine atom and a fluorine atom, and
- b. in (I-1) and (I-2), in a case in which at least one of X^1 , X^8 , X^9 and X^{10} represents a fluorine atom, and a remainder represent hydrogen atoms, then at least one of X^3 , X^4 , X^5 and X^6 represents either one of a chlorine atom and a fluorine atom);

L^2 represents a single bond; n represents 1; and

Y represents any one of a hydrogen atom, a fluorine atom, a chlorine atom, a trifluoromethoxy group, a difluoromethoxy group, a trifluoromethyl group, a 3,3,3-trifluoroethoxy group, a cyano group, a straight chain alkyl group of 1 to 16 carbon atoms, a straight chain alkenyl group of 2 to 16 carbon atoms, a straight chain alkyloxy group of 1 to 12 carbon atoms, and a straight chain alkenyloxy group of 2 to 16 carbon atoms, provided that cases described below are excluded:

- ~~i. a case in which ring B represents (I-2), n represents 0, R represents an alkyl group and Y represents an alkyl group,~~
- ~~ii. a case in which ring B represents (I-3), n represents 0, R represents an alkyl group and Y represents an alkoxy group,~~
- ~~iii. a case in which ring B represents (I-4), n represents 0, R represents an alkyl group and Y represents either one of an alkyl group and a cyano group,~~

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- iv. ~~a case in which ring B represents (I-8), n represents 0, R represents an alkyl group and Y represents an alkyl group,~~
- v. ~~a case in which ring B represents (I-4), n represents 1, ring C represents a 1,4-phenylene group, L² represents -CO₂-, R represents an alkyl group and Y represents any one of an alkyl group, an alkoxy group and a cyano group,~~
- vi. ~~a case in which ring B represents (I-4), n represents 1, ring C represents a 1,4-phenylene group, L² represents -OCO-, R represents an alkyl group and Y represents an alkoxy group,~~
- vii. ~~a case in which ring B represents (I-2), n represents 1, ring C represents a 1,4-cyclohexylene group, L² represents -CO₂-, R represents an alkyl group and Y represents an alkyl group,~~
- viii. a case in which ring B represents (I-1), and X⁹ and X¹⁰ represent fluorine atoms, and
- ix. a case in which ring B represents (I-3), and X³, X⁴, X⁵ and X⁶ simultaneously represent fluorine atoms.